

CLAIMS

What is claimed is:

1. A communication system comprising:

a receiver structured to receive a substantially continuous sine wave carrier signal, the signal modulated to contain communication data;

a demodulator communicating with the receiver, the demodulator structured to demodulate the communication data from the substantially continuous sine wave carrier signal; and

a transmitter coupled to the demodulator, the transmitter structured to transmit a plurality of electromagnetic pulses, with the pulses configured to include the communication data.
2. The communication system of claim 1, wherein the substantially continuous sine wave carrier signal is selected from a group consisting of: an amplitude modulated signal, a phase angle modulated signal, a frequency angle modulated signal, an orthogonal frequency division multiplexing modulated signal, a quadrature amplitude modulation signal, a dual sideband modulated signal, a single sideband modulated signal, and a vestigial sideband modulated signal.
3. The communication system of claim 1, wherein the substantially continuous sine wave carrier signal has a radio frequency bandwidth that may range between about 10 kilohertz to about 5 megahertz.

4. The communication system of claim 1, wherein the demodulator is selected from a group consisting of: an amplitude demodulation circuit, a quadrature amplitude demodulation circuit, a frequency angle demodulation circuit, a phase angle demodulation circuit, and an orthogonal frequency division demodulating circuit.
5. The communication system of claim 4, wherein the amplitude demodulation circuit is selected from a group consisting of: a dual sideband demodulation circuit, a single sideband demodulation circuit, and a vestigial sideband demodulation circuit.
6. The communication system of claim 2, wherein the dual sideband modulated signal has a suppressed carrier.
7. The communication system of 4, wherein the amplitude demodulation circuit comprises a low pass filter.
8. The communication system of claim 2, wherein the single sideband modulated signal has a suppressed carrier.
9. The communication system of claim 1, further including a first transmission medium coupled to the receiver, wherein the receiver receives the substantially continuous sine wave carrier signal through the first transmission medium.

10. The communication system of claim 9, wherein the first transmission medium is a wireless medium.

11. The communication system of claim 9, wherein the first transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

12. The communication system of claim 1, further including a second transmission medium coupled to the transmitter, wherein the transmitter transmits the plurality of electromagnetic pulses through the second transmission medium.

13. The communication system of claim 12, wherein the second transmission medium is a wireless medium.

14. The communication system of claim 12, wherein the second transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

15. The communication system of claim 1, wherein each of the plurality of electromagnetic pulses comprises an ultra-wideband pulse.

16. The communication system of claim 15, wherein each of the plurality of ultra-wideband pulses has a duration that ranges from about 10 picoseconds to about 10 milliseconds.

17. The communication system of claim 1, wherein the transmitter comprises an ultra-wideband pulse modulator that is structured to transmit a multiplicity of ultra-wideband pulses.

18. The communication system of claim 17, wherein the ultra-wideband pulse modulator is selected from a group consisting of: a pulse amplitude modulator, a pulse position modulator, a pulse duration modulator, a ternary pulse modulator, an on-off keying pulse modulator, a coded recurrence modulator, a sloped amplitude modulator, and a pulse phase modulator.

19. The communication system of claim 1, wherein each of the plurality of transmitted electromagnetic pulses occupies substantially the same radio frequency spectrum.

20. The communication system of claim 1, wherein each of the plurality of electromagnetic pulses is transmitted so that each pulse occupies a discrete portion of the radio frequency spectrum.

21. The communication system of claim 1, wherein the communication data is selected from a group consisting of: voice data, video data, audio data, and high-definition video data.

22. The communication system of claim 1, wherein the communication data is segmented into individual components selected from a group consisting of: received data, routing information, destination information, quality-of-service information, bit-error-rate information, priority information and latency information.

23. The communication system of claim 1, wherein the communication data is received in a first communication format, segmented, and re-assembled in a second communication format.

24. The communication system of claim 23, wherein the second communication format comprises an ultra-wideband communication format.

25. The communication system of claim 23, wherein the first communication format includes a format selected from a group consisting of: a substantially continuous sine wave carrier signal format; an amplitude modulated signal format, a phase angle

modulated signal format, a frequency angle modulated signal format, an orthogonal frequency division multiplexing modulated signal format, a quadrature amplitude modulation signal format, a dual sideband modulated signal format, a single sideband modulated signal format, and a vestigial sideband modulated signal format.

26. A communication system comprising:

a receiver structured to receive a plurality of electromagnetic pulses, with the electromagnetic pulses configured to include communication data.

a demodulator communicating with the receiver, the demodulator structured to demodulate the communication data from the plurality of electromagnetic pulses; and

a transmitter coupled to the demodulator, the transmitter structured to transmit a substantially continuous sine wave carrier signal, the signal modulated to contain the communication data.

27. The communication system of claim 26, wherein the communication data is selected from a group consisting of: voice data, video data, audio data, and high-definition video data.

28. The communication system of claim 26, wherein the substantially continuous sine wave carrier signal is selected from a group consisting of: an amplitude modulated signal, a phase angle modulated signal, a frequency angle modulated signal, an orthogonal frequency division multiplexing modulated signal, a quadrature amplitude modulation

signal, a dual sideband modulated signal, a single sideband modulated signal, and a vestigial sideband modulated signal.

29. The communication system of claim 26, wherein the substantially continuous sine wave carrier signal has a radio frequency bandwidth that may range between about 10 kilohertz to about 5 megahertz.

30. The communication system of claim 26, further including a first transmission medium coupled to the receiver, wherein the receiver receives the plurality of electromagnetic pulses through the first transmission medium.

31. The communication system of claim 30, wherein the first transmission medium is a wireless medium.

32. The communication system of claim 30, wherein the first transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

33. The communication system of claim 26, further including a second transmission medium coupled to the transmitter, wherein the transmitter transmits the substantially continuous sine wave carrier signal through the second transmission medium.

34. The communication system of claim 33, wherein the second transmission medium is a wireless medium.

35. The communication system of claim 33, wherein the second transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

36. The communication system of claim 26, wherein each of the plurality of electromagnetic pulses comprises an ultra-wideband pulse.

37. The communication system of claim 36, wherein each of the plurality of ultra-wideband pulses has a duration that ranges from about 10 picoseconds to about 10 milliseconds.

38. The communication system of claim 26, wherein the communication data is segmented into individual components selected from a group consisting of: received data, routing information, destination information, quality-of-service information, bit-error-rate information, priority information and latency information.

39. The communication system of claim 26, wherein the communication data is received in a first communication format, segmented, and re-assembled in a second communication format.

40. The communication system of claim 39, wherein the first communication format comprises an ultra-wideband communication format.

41. The communication system of claim 39, wherein the second communication format includes a format selected from a group consisting of: a substantially continuous sine wave carrier signal format; an amplitude modulated signal format, a phase angle modulated signal format, a frequency angle modulated signal format, an orthogonal frequency division multiplexing modulated signal format, a quadrature amplitude modulation signal format, a dual sideband modulated signal format, a single sideband modulated signal format, and a vestigial sideband modulated signal format.

42. A communication system comprising:

a receiver structured to receive a plurality of electromagnetic pulses, with the electromagnetic pulses configured to include communication data.

a demodulator communicating with the receiver, the demodulator structured to demodulate the communication data from the plurality of electromagnetic pulses; and

a transmitter coupled to the demodulator, the transmitter structured to transmit a plurality of electromagnetic pulses, the pulses configured to include communication data;

wherein the transmitted and received electromagnetic pulses are either a plurality of single-band electromagnetic pulses or a plurality of multi-band electromagnetic pulses.

43. The communication system of claim 42, wherein the communication data is selected from a group consisting of: voice data, video data, audio data, and high-definition video data.

44. The communication system of claim 42, wherein the plurality of single-band electromagnetic pulses have a radio frequency bandwidth that may range between about 2 gigahertz to greater than 10 gigahertz.

45. The communication system of claim 42, wherein the plurality of multi-band electromagnetic pulses have a radio frequency bandwidth that may range between about 200 megahertz to about 1 gigahertz.

46. The communication system of claim 42, further including a transmission medium coupled to either the receiver or the transmitter, wherein the receiver receives the plurality of electromagnetic pulses through the transmission medium, or the transmitter transmits the plurality of electromagnetic pulses through the transmission medium

47. The communication system of claim 46, wherein the transmission medium is a wireless medium.

48. The communication system of claim 46, wherein the transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.